PHILADELPHIA NEUROLOGICAL SOCIETY.

November 24, 1903.

The President, Dr. H. A. Hare, in the Chair.

Dr. M. Allen Starr read a paper entitled: "Is Epilepsy a Functional Disease?" (To be published later in this journal.)

Dr. M. W. Barr said that the question as to whether epilepsy be a functional or an organic disease, has warm advocates on either side. The divergence of opinion is doubtless due to the character of the cases presented, and the standpoint from which, therefore, epilepsy has been viewed. For instance, those attacks appearing suddenly after irregular habits of living, might be considered by some as due to functional disorder of the brain or of the digestive organs, while maniacal and homicidal tendencies might indicate brain lesion or other organic trouble. From his possibly limited observation of some 800 cases, he could readily see how one could incline to whichever of these views might have preponderated in a hundred or so cases presented, and his experience led him to see further that both might be right and both wrong.

He held with Dr. Starr that epilepsy is a symptom of degenerative enfeebled condition, which may advance into disease according to the dominating power of cause. This following, of course, the line of least resistance, attacks that part of the system already disintegrated by degenerative influences—hereditary or accidental—which succumbs easily, and under repeated attacks may fall into a diseased condition. Such conditions, encountered again and again, the observer of some fifty or one hundred cases might with reason claim as cause, whereas more extensive data would prove it not cause, but effect.

The fact that 56 per cent. of 800 cases of epilepsy Dr. Barr had examined had a history of grave neurotic heredity—over 6 per cent. of heredity direct, being of epileptic parentage—tended to convince him that epilepsy is a symptom of degenerated conditions, appearing often in early infancy in the form of eclampsia. Indeed, he was confident that a large proportion of the spasms in early childhood were epileptic, due in a large measure to the influences of heredity, the combination and concentration of varied neuroses tending to produce and to intensify epilepsy.

It is possible that merely a high-strung, overwrought nervous condition of one ancestor may combine with tuberculosis, neuralgia, migraine or hysteria, to produce the same unfortunate result, as would the combination of any two of these, or again of any one, with insanity or imbecility. Again, it is claimed by some that this degeneracy does not extend to the brain, and that epileptics are not necessarily mentally enfeebled. The experience of such observers, may, it is true, cover larger area than Dr. Barr's, which was limited to some 800 cases, but among these cases drawn from every phase and class of society—from the homes of the wealthy and the cultured, the almshouse, the gutter, and the abodes of vice—he had yet to see the epileptic who is not imbecile—using the term in its broadest sense, imbecellus—tottering, needing help. In every case there is mental impairment—slight it may be, but present always—enfeeblement that every attack will tend to increase; every spasm weakens the intellect just so much. True it is that epileptics may accomplish many things in life; that they may earn a living, may be possessed of talents, may even fill acceptably exalted stations—but somewhere or at sometime you trace the irresponsible act, the peculiar idiosyncrasy that betrays that mental impairment that always may be counted upon, gradual but certain in its progress.

Imbecility, idiocy, and dementia will be found in fully 80 per cent. of all epileptic communities. In feeble-minded institutions it is found chiefly among the brighter class of imbeciles—the cases of idiot epileptics being comparatively few and confined to those where the deterioration has been the gradual result of epileptic seizures.

As undefinable as it is baffling, he would yet describe epilepsy as a degenerated condition of tissue, nerve, and of nerve centers; by reason of which nervous energy from its very initial point of formation is tainted and corrupted in its production, transmission, and elimination. Thus this ill-regulated supply of vitiated force, finding insufficient control in degenerated nerve centers is given off in explosions, at irregular intervals; evidenced in temporary suspension of motor coördination, in convulsive movements,—total or partial—and often followed by general prostration—more or less excessive or prolonged—of the entire nervous system, causing a gradual but certain deterioration of all the powers of the being—physical, mental and moral.

It is claimed that from 50 to 75 per cent. of epileptics may be improved, and from 6 to 12 per cent. cured, but he had never known a recovery that he considered permanent, nor did he think there is data from sufficiently prolonged observation to substantiate such an assertion. He had no faith in those who profess to cure epilepsy, or in the permanent benefit to those so cured, and he found no warrant for departing from the dictum of Hippocrates, that: "The prognosis in epilepsy is unfavorable when the disease is congenital, where it continues to manhood or where it occurs in an adult. We may attempt to cure the young, but not the old." "MAY *attempt,*" mark you, but Dr. Barr found nothing to justify the hope of ultimate and permanent cure; and all we can say is that epilepsy is due to a something so subtle and elusive that it has so far escaped us; a poison, so to speak, for which we have not yet found the antidote. But release from such affliction even for a time cannot but be counted a boon, and the fact that treatment and environment can accomplish this, for so large a proportion, is surely a proof of progress. There are, indeed, many examples of complete exemption for various periods of time. He had under his care a man of 36, with a record of convulsions at two and one-half years, who within the last four years developed epilepsy, and for two years the attacks increased with force and frequency, but yielded gradually to treatment, and for the last twelve months, there has been a complete cessation of spasms. Another where there was immunity of spasms for sixty years; another for twenty-five years, and yet another for eighteen years. He once reduced the spasms of a man from several seizures a day to one in three years. The man's family physician considered him cured, but Dr. Barr never did, and he died finally in a sudden attack, before Dr. Barr could reach him, although responding within five minutes to call.

Indeed, a reduction of several seizures a day to an equal number per year is not infrequent. He recalled one case that had run the gamut of doctors in France, Germany and England, and who was with Gowers for two years. Dr. Barr reduced the spasms from twenty-eight in one day to one in every ten days. Christian Scientists have since, they say, accomplished cure, although the spasms still continue.

Some years ago, he had under his care an epileptic girl, whose father, a physician, boasting of his success in the cure of epilepsy, is now an insane epileptic in one ward of a hospital, and his wife and daughter, also insane epileptics, are inmates of another.

The life period in epileptics is mercifully brief, the spasms encroaching more and more upon physical resources. He found that twenty-five years is the average limit, and the comparatively few who enter upon or pass the thirty mark, rapidly become physiologically old.

Death, always imminent, may come at any moment, any spasm being liable to terminate in asphyxia, or in brain suffusion. Fully 25 per cent. of all deaths occur in status epilepticus, or else undeveloped constitutions, unable to resist, succumb readily to the inroads of disease, especially tuberculosis, or to cardio-vascular affections—embolism, thrombosis, etc.—to which epileptics are all peculiarly susceptible.

If, as is not an infrequently accepted theory, spasms are but an excessive accumulation and sudden discharge of nervous energy, due to imperfection and impairment of the sensory and motor cells, then, naturally, we look to pathologic conditions of the brain for a solution of the question and for facts concerning theory. But the pathologic changes are either so minute or so inconstant as to evade detection.

True it is, that the necropsies, in cases of death from status epilepticus, reveal intense congestion—the veins and sinuses deeply engorged, the meninges injected; the white portion of the brain shows punctate hemorrhages, and the gray matter is darkened or has a pink tinge. But these are found also in cases of prolonged asphyxia which were non-epileptic, and, therefore, can be accepted only as a result and not a cause.

Pathology, therefore, still enshrouded in obscurity, furnishes little more than grounds for conjecture, and one may as well question the silenced gun of its cannonading; the explosion has come and gone, and left no trace of how.

Dr. S. Weir Mitchell said that for many years he had been inclined to accept the view announced by Dr. Starr, but that there were difficulties in his way of accepting some of the means by which the speaker desired to prove his position. One of these was as to the constant finding in the brain of some lesion which was assigned as the cause of the epilepsy. In epilepsy, the necropsy nearly always comes after many years of the disease, and nothing is allowed for the changes caused by the disease itself. He would like to hear something said in regard to cases of epilepsy which occurred in men of the highest intelligence, like Napoleon and Mohammet, but who only occasionally had epileptic attacks. He had himself known of several such cases. One was a lawyer of great distinction. In such cases, where the attacks occur rarely, he would find it still more difficult to attribute them to an organic lesion.

With regard to treatment, he had seen a number of people apparently get well from epilepsy, and go for many years without an attack. In some cases, the attacks had stopped under curious circumstances. In one case the attacks began at the age of ten years and continued until the age of twenty-one, when the patient entered the army during the civil war. From the time he got into the saddle until his death, many years later, from heart disease, he did not have an attack. A second case was that of a young Virginian, who came under the speaker's observation two years before the war. He had frequent and violent attacks. He entered the service and lost his epileptic attacks, and had had no recurrence when last seen, fifteen years later. The attacks are often suspended in a curious way by a variety of causes. Operations on the head or even other portions of the body will suspend the attacks for a certain length of time. The bringing of the patient into the hospital for the purpose of studying the attacks, is often sufficient to suspend them for a number of weeks. He had seen the attacks suspended by an attack of jaundice, and also in two cases by whooping-cough. Pneumonia and also bronchitis have suspended the epilepsy.

Dr. F. X. Dercum remarked that for many years he had believed that there were morphological changes in epilepsy. A number of years ago he had presented a series of twelve brains from epileptics, each one of which showed some gyral or convolutional anomaly. The morphological peculiarities are not limited to changes in the nervous system, the great mass of cases presenting obvious stigmata of arrested development in other parts, as shown by the high arched palate, anomalies of dentition, peculiarities in the shape of the head, skull, etc. We have undoubtedly in the epileptic a defective organism. Although we recognize the existence of these curious changes, they do not explain the occurrence of convulsions. In a large proportion of the insane there are structural peculiarities and morphological defects. The mere existence of morphological peculiarities does not mean epilepsy. It must be that there is something else at work. We must not forget the observations made with regard to the toxicity of the secretions in epileptics as compared with the normal individual. It has been found that the blood serum of the epileptic is hypertoxic. Observations have also been made on the condition of the urine. Several writers have noted a persistent hypertoxicity of the urine. These facts must have a meaning. It may be that in the epileptic the tissue metabolism is different from that in the normal individual, and we have toxic substances present as a result.

We must widen our conception of epilepsy beyond considering it a morphological disease purely. It is one largely, but can not be one exclusively. It has been noted on a number of occasions that the epileptic seizures are stopped by an attack of pneumonia or other grave illness. It is possible that the increased oxidation of the tissues under these circumstances may lead to a burning up of the toxins, as it were.

While it is true that we cannot cure epilepsy, Dr. Dercum held that in a large number of cases the disease can be mitigated, and in a certain number of cases to such an extent that it amounts to a cure. The word cure has only a relative application.

Dr. Charles K. Mills fully agreed with Dr. Starr that epilepsy is an organic disease. He did not think that anybody with experience could hold that it was anything else. The point is to discover what is the original condition in this organic disease. If there were any criticism to be made on the papers and the remarks already made, it was that they had not in a clear cut manner separated this disease, idiopathic epilepsy, from the other forms, such as Jacksonian epilepsy, epileptic attacks with diplegia and the toxin forms. He did not know that he could do this any better than the other speakers had done. It was clear to him that the term Jacksonian epilepsy should be restricted usually to a disease in which there is an organic lesion which is easily discoverable by the naked eye, or by the low powers of the microscope. Idiopathic epilepsy is of another class. It belongs to the same class of degenerative diseases as dementia præcox. Anatomically speaking, it is a cortical agenesis, but it is more than this.

With regard to lesions of Ammon's horn and similar lesions which he had studied twenty years ago, he did not believe that they were the basis of the disease. It is anatomically a cortical and cerebral arrest.

Dr. William G. Spiller said he had examined the records of a hundred cases that had come under his observation within the last year or two. He had found the age of onset to be between 1 and 5 years in 30 cases, between 5 and 10 years in 14 cases, between 10 and 15 years in 13 cases, between 15 and 20 years in 15 cases, between 20 and 25 years in 9 cases, between 25 and 30 years in 5 cases, betwen 30 and 35 years in 7 cases, between 35 and 40 years in 1 case, between 40 and 45 years in 1 case, between 45 and 50 years in 1 case, and unknown in 4 cases.

Epilepsy had occurred in the same family in 17 cases. An aura was recognized in 38 cases. A history of alcoholism in one or both parents was obtained in 11 cases. Mentality was much impaired in 12 of the 16 cases studied at the Philadelphia Hospital. These 16 cases were in a more advanced stage of the disease than the remaining 84 cases.

Some interesting statements were obtained regarding remissions. In one case convulsions began at the age of 4 years and ceased until the patient was 13 years old. In another case, spasms occurred during teething, petit mal developed at the age of 7 years, but soon ceased, and epileptic attacks began again at the age of 16 years. A female, 19 years old, had teething spasms at 18 months, but had no further epileptic attacks until she was 19 years old. A male, 26 years old, had attacks that ceased when he was 5 or 6 years old, but began again when he was 22 years old. His brother was epileptic. A male, 14 years old, had attacks when 5 years old; these soon ceased, and he had no more attacks until he was 12 years old. A male, 25 years old, had convulsions until he was 5 or 6 years of age. The convulsions began again when he was 17 years of age. A female, 44 years old, had convulsions when she was 18 months old. They then ceased until she was 12 or 13 years old, and the convulsions began again at that age and were typical. From 16 until she was 43 years old she had no convulsions, although she had attacks in which she felt faint but did not lose consciousness. When she was 43 years old convulsions began again and were frequent. Puberty and the menopause were important periods in her case regarding the convulsive attacks. This case afforded the nearest approach to a cure Dr. Spiller had seen.

The effect of unusual exertion was noticed in one case. A male, 20 years old, had his first convulsion when 19 years old, after dancing all night. He had had 5 attacks, and all five had occurred while he was playing ball.

The early manifestation that may occur in hereditary cases was shown by a girl, 4 years old, who had had about 100 convulsions in the first week of life, then no more until she was 3 months old. A paternal aunt and paternal cousin had convulsions. The convulsions in the child were typical.

The influence of pregnancy was shown in two cases. A woman, aged twenty-six years, had had epileptic attacks since she was fourteen years old, and had been free from them only when pregnant. Another woman had her first epileptic attack one week before the birth of her child.

The influence of menstruation was shown in a number of cases. As an illustration, a girl aged fifteen years, had her first convulsion five days after the first menstrual flow began.

Two cases cited as illustrations of sensory epilepsy were as follows: A man, aged fifty-one years, had his first attack when he was forty-four years old. He had used tobacco to excess. No hereditary taint was known. The aura was a drowsy feeling. The attacks consisted of numbness in the right side of the tongue and right upper and lower limbs. Sometimes he would lose consciousness and fall; at other times when consciousness was preserved he lost his speech. Convulsions were not observed until about seven years after the beginning of the sensory attacks.

A male, aged thirty-two years, had attacks first when he was twelve years old. He had convulsions and at other times attacks in which he lost one-half of the visual fields, sometimes the left half and sometimes the right half. This form of attack lasted ten to twenty minutes, and the attack was followed by numbness of the body and headache. The first attack of hemianopsia occurred when the patient was fifteen years old. This case shows a relation between migraine and epilepsy.

Dr. Spiller referred to a peculiar aura in one case. A ravenous appetite preceded the convulsive attack ten to twelve hours, and was almost invariably followed by a convulsive attack. Another peculiar aura was the sensation of a bright light and a taste of raw beef. Objects appeared larger and sometimes smaller.

In most cases of epilepsy the gross lesion, when present, precedes the first convulsive attack, but that this is not always so was shown by the following case: A male, aged sixteen years, had his first epileptic attack when eight years old. He had had many severe convulsions, and when fifteen years old had status epilepticus. About eight hours later his entire right side was paralyzed. Speech was lost about a month. When examined at the age of sixteen years the right limbs were spastic, some motor aphasia was present, the gait was good but stiff, and the grip of the right hand was about normal. It seemed probable that a vascular lesion had developed during the status epilepticus.

Dr. W. W. Keen said that after the brilliant papers of Horsley some years ago, we all looked forward to the time when surgery would do wonders for epilepsy, but time has shown that surgery can do much less than was then believed to be possible. In a few cases he had been able to effect what was apparently a cure. Reference was made to the case of a lad who fell down stairs. Whether the fall was the cause of the epilepsy or his first epileptic fit was the cause of the fall, was uncertain. The fall caused a small scar on the head. After the fall he had epilepsy for a number of years, the attacks increasing in frequency. Operation was then determined upon and only the scar was removed, as there was no evidence of injury to the bone; nothing more was done. The operation was performed twelve or fifteen years ago and the young man had not had a single attack since.

Twelve years ago the speaker had been called to see a young man who had been struck on the head by a pully-wheel weighing thirty pounds and falling thirty-six feet. The blow was received in the middle line of the head a little posteriorly. A considerable portion of bone was removed and there was a large loss of brain substance. The superior longitudinal sinus was torn. The patient recovered and some time later was admitted to the hospital on account of a continuous discharge at the posterior portion of the head. A piece of necrossed bone was removed, showing the T-shaped groove for the posterior portion of the longitudinal sinus and the two lateral sinuses. Between the line of the accident and the removal of this bone, he had one epileptic attack. He was seen within a few days and he reported that he had not had another attack since then.

A third case was seen at the Orthopedic Hospital ten years ago. The patient stated that the attacks began in the night and always in the right thumb. The attacks were becoming more frequent, and had appeared also in the daytime and sometimes she had more than one. During the two weeks that she was under observation during the entire night, five attacks were observed, each beginning in the right thumb, extending to the arm and then becoming general. The thumb-center on the left side of the brain was exposed, identified by the battery and excised,—a piece the size of the last phalanx of the finger being removed. On recovery from the ether, there was paralysis of the muscles of the thumb and not a single other muscle was affected. In the course of the next few days the paralysis extended as far as the elbow. After remaining stationary for a few days, it began to recede. At the end of 17 days slight voluntary movement in the thumb was noted, and in six months no difference could be detected in the two hands. The case was followed for five years, and during that time the attacks had occurred only about once a year.

He referred also to a case reported by Dr. Briggs, of Nashville, of a girl who was epileptic and also had necrosis of the tibia. He operated on the necrosis and five years later the girl had not had an attack of epilepsy.

In a number of cases where it seemed clearly demonstrated that there must be a gross lesion of the brain, he made a large osteoplastic resection of the skull and found nothing. In the majority of the cases he had opedated upon there had been no benefit although they had not been made worse. In spite, however, of the fact that only a small number of cases had been benefited or cured, the disease is such a dreadful disorder and its consequences, physical, mental and social, so deplorable, that he was in favor of operation.

Dr. A. A. Eshner stated that from the observation of a large number of cases of epilepsy clinically, he had come to the conclusion that the disorder is one of unstable motor equilibrium which is influenced by a variety of causes. Some are the so-called reflex, many toxic, and some result from deranged metabolism. He believed that the frequency of the attacks is influenced somewhat in the same manner as other habits are influenced. they are permitted to recur with great frequency a tendency to increase will manifest itself, while if the frequency is diminished a tendency to lessen will manifest itself.

He was prepared to believe that this condition of unstable equilibrium is due to structural disturbance. He believed also that this in turn was aggravated by the recurrence of the attacks. There is thus established a vicious circle.

He suggested that something more might be said with reference to the relation of infectious disease to epilepsy, and also as to the eclampsia of childhood.

Dr. J. Madison Taylor said that he arose with diffidence after hearing words of such wisdom and power, but some one should protest against the hopelessness of the conclusions expressed. He begged that the statements of Dr. Starr, when published, might be modified and made less pessimistic. Dr. M. Allen Starr comes from New York with two thousand personally conducted cases, and says, in effect, that epilepsy cannot be cured and little mitigated. His hearers, and worse, the many readers of his published utterances, will acquire the conviction that nothing can be expected from medical treatment. Dr. W. W. Keen, the high priest of brain surgery, agrees with him that few, or no, good results can come from operative interference. Two classes of people will be disappointed grievously: one, the medical men, who at least make honest efforts to cure or mitigate the horrors of epilepsy, and they should be allowed to cherish expectation of undiscovered possibilities. The other class, the sufferers from the Morbus Sacer, should not be deprived of hope for the future. The statements heard were from facts derived from two chief sources, one clinical experience which offers little promise; the other, the dead-house and the findings of neuropathology. Practically nothing had been said of physiology, or variants in normal processes, a study of which in this direction is not yet exhaustive. Large possibilities exist through a study of the functions of the ductless glands, opened up by the researches of Dr. Sajous, through which new conclusions may well be reached.

Again, the study of vaso-tonus and metabolism, as affected by mechanical control of nervous mechanisms restoring lost balance, offer much. Finally the, as yet unknown, possibilities of controlling the developmental processes in the young have been so far only suggested, but are of great promise. By no means should hope die till epilepsy be fully studied by qualified physiologic clinicians and therapeutists.

Dr. F. Savary Pearce remarked that he did not believe that all cases of epilepsy were of organic origin. Children often have at an early age, convulsions which are exactly like those of idiopathic epilepsy, but the child gets well and grows to adult life and has no further trouble. With reference to shock and fright as causes of epilepsy, he had seen one case of epilepsy due to mental shock. He did not consider that to be a case of organic diseases. Bearing on the effect of fright, he alluded to the case of a young girl worried over a love affair, whose hair turned white as a result. She was well mentally. Another instance referred to was that of a man whose hair fell out universally as the result of worry. This was not an organic case, at first at least. He had now under observation a child with marasmus and organic disease of the brain. The child has had as many as four hundred epileptic attacks in a month, the average being six or eight a day. The child is improving as regards the marasmus, and has had no attacks of epilepsy for six or eight weeks. This is an organic case that may recover. The child is taking no bromides; but is given the syrup of the iodide of iron. Dr. Pearce did not think that such conditions as gliosis and enlargement of the thymus gland were causes of epilepsy.

The speaker also referred to some studies of the blood which he had made in epilepsy, which seemed to show that there was some derangement of the blood-making organs in this disease.

He had seen typical alcoholic epilepsy. Every time the man would drink he would get epilepsy. If this patient stopped drinking, the epilepsy would cease. This he considered a symptomatic epilepsy and not an organic disease. He did not believe that epilepsy implied organic disease of the brain primarily at all; but that disturbed function was the cause later of any organic changes that may be found in idopathic epilepsy.

Dr. M. Allen Starr, in closing the discussion, said that he had expected a certain amount of criticism of the position that he had taken, and admitted that some of the statements brought forward were strong and did not coincide with the conclusions that he reached. He thought, however, that the consensus of opinion was rather in favor of the view that a great many cases of epilepsy, at least, were organic in their nature. The statement made by Dr. Barr that idiots were less liable to epilepsy than weak-minded individuals, coincided with his observations. This indicates that epilepsy is a disease of the more highly developed centers. Confirmation may be drawn from comparative pathology. Animals do not have epilepsy to any great extent. The experiments of Brown-Séquard on guinea pigs have failed of confirmation in other hands.

The remarks of Dr. Weir Mitchell had been of extreme interest to him. His first point has been urged by every writer upon the subject of the lesson in epilepsy,—namely, that the lesions in the brain of epileptics are secondary. This argument he thought carried little weight. Many of the lesions may be secondary, but in such cases there may be a small plaque of sclerosis as the cause of the epilepsy. It is admitted that in Jacksonian epilepsy such a lesion will cause the attacks. If this is so in cases where the lesion can be located, it is not likely that a similar small lesion may exist in the brain of the epileptic and escape our notice? Brains have not yet been examined with sufficient care to show that there are no plaques of sclerosis. To examine one brain thoroughly requires expert work ten hours a day for a year. While it may be that these large areas of sclerosis are the result of long-continued degenerative change, yet he believed that they were the culmination of something that started somewhere a long time before.

Dr. Mitchell had referred to individuals with a high type of brain having occasional attacks of epilepsy. Others had spoken of the alcoholic and toxic cases. He had not been speaking of the exceptional cases that have an attack once in two or three years. He had referred to the ordinary idiopathic epilepsy that physicians are seeing every day. He was not blind to the fact that a man may have a toxic convulsion or that an epileptic may have a convulsion as the result of a toxic condition.

Dr. Mitchell had stated that he had seen some cures of epilepsy. A few months ago, at a discussion before the London Pathological Society, Dr. Turner had reported a large number of cases of epilepsy with six per cent of cures. Recently, in looking up the subject of optic nerve atrophy, the speaker had come across a series of cases of optic nerve atrophy without apparent cause. In a very interesting series published in London, there were two cases of primary optic nerve atrophy without any explanation, occurring at the ages of sixteen and eighteen years, the patients living for thirty-five and forty years. When the cases came to autopsy, a small tumor was found in the brain in both instances as the cause of the optic nerve atrophy. It might be said that these were cases of brain tumor cured. If an individual can carry a brain tumor for forty years without symptoms, Dr. Starr saw no reason why he should not carry a small plaque of sclerosis which had occurred early in life and caused a fit perhaps without producing a second fit. The fact of cure does not militate against the existence of a lesion. The fact that epilepsy may occur in men of high type would indicate that in such cases the lesion does not involve the parts concerned in higher brain processes. We know that hemiplegia may exist for years without impairing the mental condition. He did not claim that the existence of a small plaque was necessarily productive of mental deterioration. The effect of mental influence in epilepsy is wonderful. This is shown by the effect of operation and of change of physicians. It is his custom after treating a patient for some time when the patient ceases to improve or goes backward, to refer him to another physician.

He agreed perfectly with what had been said about attacks of epilepsy being checked during the course of infectious diseases at times. He had repeatedly seen this in typhoid fever. Several of the speakers had alluded to toxic states. He had also referred to this in his paper and had spoken of the necessity of eliminating all toxic conditions. We know very little about physiological pathology. We know a good deal about morphological pathology. There is such a thing as the pathology of the change of function, and in many cases of epilepsy the disease rests upon that basis.

One of the speakers did not think it necessary to infer a lesion in one center of the brain because the aura affected that center. The speaker had a patient who had an aura in the right visual field with every attack from the age of fourteen years to 37 years. Then he suddenly developed a right hemianopsia. It seems likely that the aura had been an evidence of some slight lesion involving the occipital lobe.

With regard to the influence of menstruation on the occurrence of the attacks, patients often assert that the attacks are more frequent at that time, but a careful detailed observation usually shows that this is an error. In many cases there is a certain periodicity in the attacks.

With regard to Dr. Taylor's statement that the speaker held that there was no help for the epileptic, he did not at all agree with that view. He believed that in epilepsy we are dealing with an individual who is weak, and it is necessary to take away every possible source of irritation. He thought that every one would admit that there was a field for treatment in epilepsy, but it has its limitations. The patient should not be encouraged to hope too much, or his experience would lead to disappointment.